

OCT 05 2006

Serial No. 10/535,561  
 Reply to Office Action of August 9, 2006

**REMARKS/ARGUMENTS**

Prior to this Amendment, claims 1 and 3-33 were pending in the application.

The August 9, 2006 Office Action withdraws all anticipation rejections of the pending claims, but the Office Action maintains obviousness rejections of the claims.

Claims 5 and 21 are amended to correct typographical errors or informalities objected to in the August 9, 2006 Office Action.

Claim 12 is amended to correct an antecedent basis issue.

Claim 26 is amended to correct an informality.

Independent claims 1, 11, and 17 are amended to include limitations that the Examiner indicated would make each of the independent claims in the case allowable over the art of record. No new matter is added by these amendments.

After entry of the Amendment, claims 1 and 3-33 remain for consideration by the Examiner.

**Priority**

Also, in the Office Action, the Examiner noted that U.S. Prov. Appl. No. 60/503,335 should not be the base priority document. Applicant provides an amendment to claim priority to the proper PCT and provisional application in the first sentence of the application. Also, Applicant is taking appropriate steps to correct this typographical error and claim priority to U.S. Prov. Appl. No. 60/503,336, which was filed September 16, 2003, e.g., has filed a supplemental declaration to the May 31, 2006 petition.

**Claim Objections**

In the Office Action, claims 5 and 21 were objected to because of informalities. These claims are amended to address the specific objections.

**Claim Rejections Under 35 U.S.C. §112**

In the August 9, 2006 Office Action, claim 12 was rejected as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. This claim is amended to provide proper antecedent basis as suggested by the Examiner.

**Allowable Subject Matter**

In the Response to the Arguments portion of the August 9, 2006 Office Action, the Examiner stated at the top of page 8 that the "Examiner would be willing

Serial No. 10/535,561  
Reply to Office Action of August 9, 2006

to allow each of the instant independent claims if they were further amended so as to recite language similar to what is recited at page 5, lines 6-10, of the specification." The purpose of such claim amendment would be to include the limitation of "creating a local electrical field at the heterojunction" in the claims specifically rather than inherently by the inclusion of the charge additives such as cation and anions as is done in the pending claims.

In response, Applicant amends independent claims 1, 11, and 17, to include a limitation regarding creating an electric field at the heterojunction as called for in the specification. Specifically, claim 1 is amended to include the language suggested by the Examiner in the Response to Arguments on page 8. Claim 11 is amended similarly but without reference to a uniform electric field. Support for these limitations is found at least at page 5, lines 6-10. Claim 17 is amended similarly to claims 1 and 11 with support found, for example, at page 15, lines 13-16, page 16, lines 15-20, and page 18, lines 6-9.

After entry of the amendment, claims 1, 11, and 17 and claims 3-10, 12-16, and 18-33, which depend from claims 1, 11, and 17, are believed to be in condition for allowance.

#### Claim Rejections under 35 U.S.C. §103

Further, in the Office Action, claims 1, 3-7, 10-12, and 14-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Cordaro. This rejection is traversed based on the following remarks.

Claims 1 and 11 are amended to include limitations directed toward forming an electric field at the interface and p-n heterojunction, respectively. Cordaro fails to show forming such an electric field integrally at the interface or heterojunction by providing anion and cation additives (or by providing spatially bound anions and cations). The Examiner indicated in the Response to Arguments at page 8 that these limitations were not shown by Cordaro. Hence, for these reasons, Cordaro fails to support an obviousness rejection of independent claims 1 and 11.

Claims 3-7 and 10 depend from claim 1 and are believed allowable as depending from an allowable base claim. Claims 12 and 14-16 depend from claim 11 and are believed allowable at least for the reasons provided for allowing claim 11.

Further, the Office Action rejected claims 8, 9, 13, and 17-33 under 35 U.S.C. §103(a) as being unpatentable over Cordaro as applied to claims 1-7, 10-12, and

Serial No. 10/535,561  
Reply to Office Action of August 9, 2006

14-16 and further in view of JP 2003-332600 ("JP '600"). This rejection is traversed based on the following remarks.

Claims 8 and 9 depend from claim 1 and claim 13 depends from claim 11, and these claims are believed allowable over Cordaro for the reasons provided with reference to claims 1 and 11.

Similarly, independent claim 17 is amended to call for a dipole or electric field to be created at the p-n heterojunction interface so as to concentrate the dipole or electric field at the interface rather than having it drop uniformly across the cell. Hence, claim 17 includes limitations similar to that of claims 1 and 11 in that anion and cation additives are provided in the p-layer and n-layer to interact and form the dipole or electric field at the interface. Hence, the reasons for allowing claims 1 and 11 over Cordaro are believed applicable to claim 17. Claims 18-33 depend from claim 17 and are believed allowable over Cordaro at least for the reasons for allowing claim 17.

Further, JP '600 is not cited as overcoming this deficiency in Cordaro but instead for its discussion of organic semiconductor particles in solar cells. As a result, the combination of Cordaro and JP '600 fail to teach or suggest the teaching of independent claims 1, 11, and 17 or dependent claims 8, 9, 13, and 18-33.

Yet further, the priority data for the application indicates a claim priority to U.S. Provisional Application 60/503,335, but, as noted by the Examiner, this provisional application is incorrect. Applicant has taken the appropriate steps to correct the provisional application serial number to "60/503,336." The priority date, however, of September 16, 2003 is correct for the 60/503,336 application, and Applicant's application claims (or will be properly corrected to address this typographical or minor clerical error) priority to this provisional application. Because JP '600 can only be used as a reference as of November 2003 rather than prior to September 16, 2003, this reference is not a proper §103(a) reference. Applicant requests that the rejections based on this reference be withdrawn for this additional reason, and claims 8, 9, 13, and 17-33 be allowed.

Also, the Office Action rejected claims 8, 9, 13, and 17-33 under 35 U.S.C. §103(a) as being unpatentable over Cordaro as applied to claims 1-7, 10-12, and 14-16 and further in view of U.S. Pat. No. 6,352,777 ("Bulovic"). This rejection is traversed based on the following remarks.

Serial No. 10/535,561  
Reply to Office Action of August 9, 2006

Claims 8 and 9 depend from claim 1 and claim 13 depends from claim 11, and these claims are believed allowable over Cordaro for the reasons provided with reference to claims 1 and 11. Similarly, independent claim 17 includes limitations similar to that of claims 1 and 11 in that anion and cation additives are provided in the p-layer and n-layer, respectively, to concentrate a dipole or electric field at the heterojunction interface. Hence, the reasons for allowing claims 1 and 11 over Cordaro are believed applicable to claim 17. Claims 18-33 depend from claim 17 and are believed allowable over Cordaro at least for the reasons for allowing claim 17.

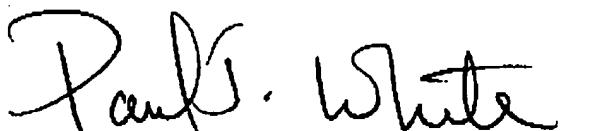
Further, Bulovic is not cited as overcoming this deficiency in Cordaro but instead for its discussion of TiOPc and PPyEI as organic semiconductor pairs. As a result, the combination of Cordaro and Bulovic fails to teach or suggest the teachings of independent claims 1, 11, and 17.

### Conclusions

In view of all of the above, it is requested that a Notice of Allowance be issued in this case.

No fee is believed due for this submittal. However, any fee deficiency associated with this submittal may be charged to Deposit Account No. 14-0460.

Respectfully submitted,



Paul J. White  
Attorney for Applicant  
Registration No. 30,436

Date: October 5, 2006

National Renewable Energy Laboratory  
1617 Cole Boulevard  
Golden, Colorado 80401  
Tel.: (303) 384-7575  
Fax: (303) 384-7499